IN THE CLAIMS

Claim 1 (original): A model for simulating the performance of a polyphase electric motor having a rotor, comprising:

a plurality of phases extending between first ends joined at a center tap and second ends extending outward from the center tap to a corresponding plurality of phase taps; and

a mutual inductance component disposed between two of the phases.

Claim 2 (original): The model of claim 1, wherein the mutual inductance component is a function of rotor position.

Claim 3 (original): The model of claim 2, wherein the mutual inductance component is a function of current.

Claim 4 (original): The model of claim 2, wherein at least one phase comprises a phase resistance component, a back emf component, and a phase inductance component, and wherein the phase inductance component is a function of rotor position.

Claim 5 (original): The model of claim 2, wherein the phase inductance component is a function of current.

Claim 6 (original): The model of claim 1, wherein at least one phase comprises a phase resistance component, a back emf component, and a phase inductance

component, and wherein the phase inductance component is a function of rotor position.

Claim 7 (currently amended): The ~~mode~~ model of claim 1, wherein at least one phase comprises a phase resistance component, a back emf component, and a phase inductance component, and wherein the back emf component is a voltage which is a function of rotor speed, motor current, and rotor position.

Claim 8 (original): A model for simulating the performance of a three phase electric motor having a rotor, comprising:

first, second, and third phases extending between first ends joined at a center tap and second ends extending outward from the center tap to first, second, and third phase taps, respectively; and

first, second, and third mutual inductance components disposed between the first and second, the second and third, and the third and first phases, respectively.

Claim 9 (original): The model of claim 8, wherein the first phase includes a first phase resistance component, a first back emf component, and a first phase inductance component connected in series between the center tap and the first phase tap; wherein the second phase includes a second phase resistance component, a second back emf component, and a second phase inductance component connected in series between the center tap and the second phase tap; and wherein the third phase includes a third phase resistance component, a third back emf component, and a third phase inductance component connected in series between the center tap and the third phase tap.

Claim 10 (original): The model of claim 9, wherein the first, second, and third mutual inductance components are a function of rotor position.

Claim 11 (original): The model of claim 10, wherein the first phase inductance component includes a first phase inductance element connected in parallel with a first leakage inductance element and a first eddy current resistance element; wherein the second phase inductance component includes a second phase inductance element connected in parallel with a second leakage inductance element and a second eddy current resistance element; and wherein the third phase inductance component includes a third phase inductance element connected in parallel with a third leakage inductance element and a third eddy current resistance element.

Claim 12 (original): The model of claim 11, wherein the first, second, and third phase inductance elements are a function of rotor position.

Claim 13 (original): The model of claim 9, wherein the first phase inductance component includes a first phase inductance element connected in parallel with a first leakage inductance element and a first eddy current resistance element; wherein the second phase inductance component includes a second phase inductance element connected in parallel with a second leakage inductance element and a second eddy current resistance element; wherein the third phase inductance component includes a third phase inductance element connected in parallel with a third leakage inductance element and a third eddy current resistance element; and wherein the first, second, and third phase inductance elements are a function of rotor position.

Claim 14 (currently amended): The model of claim 9, wherein the first, second, and third back emf components are a voltage which is a function of a magnetic flux and rotor speed~~,~~ .

Claim 15 (original): The model of claim 14, wherein the magnetic flux is a function of motor current and rotor position, whereby the first, second, and third back emf components are a function of rotor speed, rotor position, and motor current.

Claim 16 (original): The model of claim 8, wherein the first, second, and third mutual inductance components are a function of rotor position.

Claim 17 (original): A method of simulating the performance of a polyphase electric motor having a rotor, comprising:

providing a motor model having plurality of phases extending between first ends joined at a center tap and second ends extending outward from the center tap to a corresponding plurality of phase taps, and a mutual inductance component disposed between two of the phases;

applying an input signal to at least one of the phase taps;

simulating the performance of a motor using the model and the input signal; and

observing the performance of the model.

Claim 18 (original): The method of claim 17, wherein the motor model comprises first, second, and third phases extending between first ends joined at the center tap and second ends extending outward from the center tap to first, second, and third phase taps, respectively, and first, second, and third mutual inductance components disposed between the first and second, the second and third, and the third and first phases, respectively; and wherein applying an input signal to at least one of the phase taps comprises applying first, second, and third input signals to the first, second, and third phase taps, respectively.

Claim 19 (original): The method of claim 18, wherein the first, second, and third mutual inductance components are a function of rotor position.

Claim 20 (original): The method of claim 19, wherein applying the first, second, and third inputs signals to the first, second, and third phase taps comprises providing commutation signals to the first, second, and third phase taps according to a commutation scheme, and wherein observing the performance of the model further comprises determining the rotor position as a function of time.

Claim 21 (original): The method of claim 18, wherein the first phase includes a first phase resistance component, a first back emf component, and a first phase inductance component connected in series between the center tap and the first phase tap; wherein the second phase includes a second phase resistance component, a second back emf component, and a second phase inductance component connected in series between the center tap and the second phase tap; and wherein the third phase includes a third phase resistance component, a third back emf component, and a third phase inductance component connected in series between the center tap and the third phase tap.

Claim 22 (original): The method of claim 21, wherein the first phase inductance component includes a first phase inductance element connected in parallel with a first leakage inductance element and a first eddy current resistance element; wherein the second phase inductance component includes a second phase inductance element connected in parallel with a second leakage inductance element and a second eddy current resistance element; wherein the third phase inductance component includes a third phase inductance element connected in parallel with a third leakage inductance element and a third eddy current resistance element; and wherein the first, second, and third phase inductance elements are a function of rotor position.

Claim 23 (original): A load circuit for simulating the performance of a three phase electric motor having a rotor, comprising:

first, second, and third phases extending between first ends joined at a center tap and second ends extending outward from the center tap to first, second, and third phase taps, respectively; and

first, second, and third mutual inductance components disposed between the first and second, the second and third, and the third and first phases, respectively.

Claim 24 (original): The circuit of claim 23, wherein the first, second, and third mutual inductance components are a function of rotor position.

Claim 25 (original): The circuit of claim 24, wherein the first phase includes a first phase resistance component, a first back emf component, and a first phase inductance component connected in series between the center tap and the first phase tap; wherein the second phase includes a second phase resistance component, a second back emf component, and a second phase inductance component connected in series between the center tap and the second phase tap; and wherein the third phase includes a third phase resistance component, a third back emf component, and a third phase inductance component connected in series between the center tap and the third phase tap.

Claim 26 (original): The circuit of claim 25, wherein the first phase inductance component includes a first phase inductance element connected in parallel with a first leakage inductance element and a first eddy current resistance element; wherein the second phase inductance component includes a second phase inductance element connected in parallel with a second leakage inductance element and a second eddy current resistance element; wherein the third phase inductance component includes a third phase inductance element connected in parallel with a third leakage inductance

element and a third eddy current resistance element; and wherein the first, second, and third phase inductance elements are a function of rotor position.

Claim 27 (original): A method of testing a commutation scheme for controlling the position of an electric motor having a rotor, comprising:

providing a model of the motor having first, second, and third phases extending between first ends joined at a center tap and second ends extending outward from the center tap to first, second, and third phase taps, respectively, and first, second, and third mutual inductance components disposed between the first and second, the second and third, and the third and first phases, respectively;

selectively applying first, second, and third input signals to the first, second, and third phase taps, respectively according to the commutation scheme;

simulating the performance of a motor using the model and the input signals; and

observing the performance of the model.

Claim 28 (original): The method of claim 27, wherein the first, second, and third mutual inductance components are a function of rotor position.

Claim 29 (currently amended): ~~28.~~ <u>29.</u> The method of claim 27, wherein observing the performance of the model further comprises determining the rotor position as a function of time, further comprising selectively applying the first, second, and third input signals according to the rotor position.

Claim 30 (original): The method of claim 27, wherein the first phase includes a first phase resistance component, a first back emf component, and a first phase inductance component connected in series between the center tap and the first phase tap; wherein the second phase includes a second phase resistance component, a second back emf component, and a second phase inductance component connected in series between the center tap and the second phase tap; and wherein the third phase includes a third phase resistance component, a third back emf component, and a third phase inductance component connected in series between the center tap and the third phase tap.

Claim 31 (original): The method of claim 30, wherein the first phase inductance component includes a first phase inductance element connected in parallel with a first leakage inductance element and a first eddy current resistance element; wherein the second phase inductance component includes a second phase inductance element connected in parallel with a second leakage inductance element and a second eddy current resistance element; wherein the third phase inductance component includes a third phase inductance element connected in parallel with a third leakage inductance element and a third eddy current resistance element; and wherein the first, second, and third phase inductance elements are a function of rotor position.